

**CLAIMS**

1. Radio station, comprising several antennas (1, 2) associated with hybrid polarizing couplers ( $3_1$ ,  $3_2$ ), respectively, each polarizing coupler having at least one input (A1 or B1, A2 or B2) connected to radio signal processing means comprising at least one receiver (R1) and two outputs (C1 and D1, C2 and D2) connected to the antenna which is associated therewith such that when said outputs deliver two quadrature radio signals, respectively, in response to a transmission signal received on one of the two inputs of the polarizing coupler, the antenna which is associated therewith generates two orthogonal electric field components forming a circularly polarized wave, in which the receiver is arranged so as to combine several input radio signals obtained from respective inputs of the hybrid polarizing couplers and in which the antennas (1, 2) are placed so as to radiate toward diametrically opposite sectors.
2. Radio station according to claim 1, in which at least one of the hybrid polarizing couplers ( $3_1$ ,  $3_2$ ) has two inputs (A1, B1), from which two input radio signals supplied to the receiver (R1) are respectively obtained and in which the receiver is arranged so as to provide diversity processing based on said input radio signals.
3. Radio station according to claim 1 or 2, comprising two receivers (R1, R2) each receiving two input radio signals respectively, a first division means ( $5_1$ ) connected between an input (A1 or B1) of one of the hybrid polarizing couplers and first respective inputs (E1, E2) of the two receivers, and a second division means ( $5_2$ ) connected between an input (A2 or B2) of another hybrid polarizing coupler ( $3_2$ ) and second respective inputs (F1, F2) of the two receivers.
4. Radio station according to claim 3, comprising two other receivers (R3, R4) each receiving two input radio signals respectively, one of these two signals being supplied by the first division means ( $5_1$ ) and the

other of these two signals being supplied by the second division means (5<sub>2</sub>).

5. Radio station according to any one of claims 1 to 4, comprising at least one radio signal source (T1) 5 delivering said transmission signal to an input (A1 or B1) of a polarizing coupler (3<sub>1</sub>).

6. Radio station according to claim 5, comprising at least one duplexer (4<sub>1</sub>) connected between the input (A1 or B1) of the polarizing coupler (3<sub>1</sub>) to which said 10 transmission signal is delivered, an input (E1 or F1) of the receiver (R1) and the radio signal source (T1).

7. Radio station according to claim 6, in which the radio processing means and the duplexer (4<sub>1</sub>) are housed in a main housing of the radio station, each 15 antenna (1, 2) and each hybrid polarizing coupler (3<sub>1</sub>, 3<sub>2</sub>) being outside said main housing.

8. Radio station according to claim 7, characterized in that the duplexer (4<sub>1</sub>) is included in a radio circuit also including part of the radio 20 processing means.

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